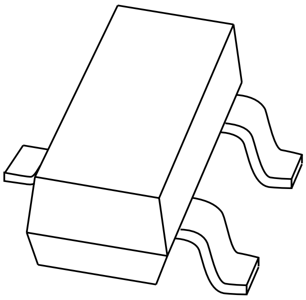
DATA SHEET



BZX84 series
Voltage regulator diodes

Product data sheet
Supersedes data of 1999 May 18

2003 Apr 10

founded by Philips

FEATURES

- Total power dissipation: max. 250 mW
- Three tolerance series: ±1%, ±2% and approx. ±5%
- Working voltage range: nom. 2.4 to 75 V (E24 range)
- Non-repetitive peak reverse power dissipation: max. 40 W.

APPLICATIONS

- General regulation functions.

DESCRIPTION

Low-power voltage regulator diodes in small SOT23 plastic SMD packages.

The diodes are available in the normalized E24 ±1% (BZX84-A), ±2% (BZX84-B) and approx. ±5% (BZX84-C) tolerance range. The series consists of 37 types with nominal working voltages from 2.4 to 75 V.

PINNING

PIN	DESCRIPTION
1	anode
2	not connected
3	cathode

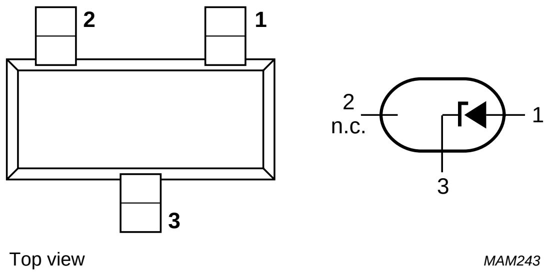


Fig.1 Simplified outline (SOT23) and symbol.

MARKING

TYPE NUMBER	MARKING CODE(1)	TYPE NUMBER	MARKING CODE(1)	TYPE NUMBER	MARKING CODE(1)	TYPE NUMBER	MARKING CODE(1)
Marking codes for BZX84-A2V4 to BZX84-A75							
BZX84-A2V4	Y50 or ∗50	BZX84-A6V2	Y60 or ∗60	BZX84-A16	Y70	BZX84-A43	Y80 or ∗C5
BZX84-A2V7	Y51 or ∗51	BZX84-A6V8	Y61 or ∗61	BZX84-A18	Y71	BZX84-A47	Y81
BZX84-A3V0	Y52 or ∗52	BZX84-A7V5	Y62 or ∗62	BZX84-A20	Y72 or ∗C2	BZX84-A51	Y82 or ∗C6
BZX84-A3V3	Y53	BZX84-A8V2	Y63 or ∗63	BZX84-A22	Y73	BZX84-A56	Y83
BZX84-A3V6	Y54 or ∗C1	BZX84-A9V1	Y64 or ∗64	BZX84-A24	Y74	BZX84-A62	Y84
BZX84-A3V9	Y55 or ∗55	BZX84-A10	Y65 or ∗65	BZX84-A27	Y75 or ∗75	BZX84-A68	Y85
BZX84-A4V3	Y56 or ∗56	BZX84-A11	Y66 or ∗04	BZX84-A30	Y76	BZX84-A75	Y86 or ∗86
BZX84-A4V7	Y57 or ∗57	BZX84-A12	Y67 or ∗67	BZX84-A33	Y77	–	–
BZX84-A5V1	Y58 or ∗58	BZX84-A13	Y68 or ∗C0	BZX84-A36	Y78 or ∗C3	–	–
BZX84-A5V6	Y59 or ∗59	BZX84-A15	Y69 or ∗69	BZX84-A39	Y79 or ∗C4	–	–
Marking codes for BZX84-B2V4 to BZX84-B75							
BZX84-B2V4	Z50 or ∗Z0	BZX84-B6V2	Z60 or ∗R5	BZX84-B16	Z70 or ∗70	BZX84-B43	Z80 or ∗S5
BZX84-B2V7	Z51 or ∗Z1	BZX84-B6V8	Z61 or ∗R6	BZX84-B18	Z71 or ∗71	BZX84-B47	Z81 or ∗S6
BZX84-B3V0	Z52 or ∗S1	BZX84-B7V5	Z62 or ∗R8	BZX84-B20	Z72 or ∗72	BZX84-B51	Z82 or ∗S9
BZX84-B3V3	Z53 or ∗S2	BZX84-B8V2	Z63 or ∗R9	BZX84-B22	Z73 or ∗73	BZX84-B56	Z83 or ∗R0
BZX84-B3V6	Z54 or ∗S3	BZX84-B9V1	Z64 or ∗T1	BZX84-B24	Z74 or ∗74	BZX84-B62	Z84 or ∗R3
BZX84-B3V9	Z55 or ∗S4	BZX84-B10	Z65 or ∗66	BZX84-B27	Z75 or ∗Z5	BZX84-B68	Z85 or ∗R4
BZX84-B4V3	Z56 or ∗S7	BZX84-B11	Z66 or ∗Z6	BZX84-B30	Z76 or ∗Z4	BZX84-B75	Z86 or ∗R7
BZX84-B4V7	Z57 or ∗S8	BZX84-B12	Z67 or ∗Z7	BZX84-B33	Z77 or ∗Y1	–	–
BZX84-B5V1	Z58 or ∗R1	BZX84-B13	Z68 or ∗Z8	BZX84-B36	Z78 or ∗Y2	–	–
BZX84-B5V6	Z59 or ∗R2	BZX84-B15	Z69 or ∗Z9	BZX84-B39	Z79 or ∗S0	–	–
Marking codes for BZX84-C2V4 to BZX84-C75							
BZX84-C2V4	Z11 or ∗T3	BZX84-C6V2	Z4∗	BZX84-C16	Y5∗	BZX84-C43	Y15 or ∗B4
BZX84-C2V7	Z12 or ∗T4	BZX84-C6V8	Z5∗	BZX84-C18	Y6∗	BZX84-C47	Y16 or ∗B5
BZX84-C3V0	Z13 or ∗T9	BZX84-C7V5	Z6∗	BZX84-C20	Y7∗	BZX84-C51	Y17 or ∗B7
BZX84-C3V3	Z14 or ∗B1	BZX84-C8V2	Z7∗	BZX84-C22	Y8∗	BZX84-C56	Y18 or ∗B8
BZX84-C3V6	Z15 or ∗B2	BZX84-C9V1	Z8∗	BZX84-C24	Y9∗	BZX84-C62	Y19 or ∗B9
BZX84-C3V9	Z16 or ∗B3	BZX84-C10	Z9∗	BZX84-C27	Y10 or ∗T2	BZX84-C68	Y20 or ∗B0
BZX84-C4V3	Z17 or ∗B6	BZX84-C11	Y1∗	BZX84-C30	Y11 or ∗T5	BZX84-C75	Y21 or ∗A1
BZX84-C4V7	Z1∗	BZX84-C12	Y2∗	BZX84-C33	Y12 or ∗T6	–	–
BZX84-C5V1	Z2∗	BZX84-C13	Y3∗	BZX84-C36	Y13 or ∗T7	–	–
BZX84-C5V6	Z3∗	BZX84-C15	Y4∗	BZX84-C39	Y14 or ∗T8	–	–

Note

1. ∗ = p : Made in Hong Kong.
   ∗ = t : Made in Malaysia.
   ∗ = W : Made in China.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_F	continuous forward current		–	200	mA
I_{ZSM}	non-repetitive peak reverse current	t_p = 100 μs; square wave; T_j = 25 °C prior to surge	see Tables 1 and 2		
P_{tot}	total power dissipation	T_{amb} = 25 °C; note 1	–	250	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	t_p = 100 μs; square wave; T_j = 25 °C prior to surge; see Fig.2	–	40	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–65	+150	°C

Note

1. Device mounted on an FR4 printed circuit-board.

ELECTRICAL CHARACTERISTICS

Total BZX84-A and B and C series

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	I_F = 10 mA; see Fig.3	0.9	V
I_R	reverse current			
	BZX84-A/B/C2V4	V_R = 1 V	50	μA
	BZX84-A/B/C2V7	V_R = 1 V	20	μA
	BZX84-A/B/C3V0	V_R = 1 V	10	μA
	BZX84-A/B/C3V3	V_R = 1 V	5	μA
	BZX84-A/B/C3V6	V_R = 1 V	5	μA
	BZX84-A/B/C3V9	V_R = 1 V	3	μA
	BZX84-A/B/C4V3	V_R = 1 V	3	μA
	BZX84-A/B/C4V7	V_R = 2 V	3	μA
	BZX84-A/B/C5V1	V_R = 2 V	2	μA
	BZX84-A/B/C5V6	V_R = 2 V	1	μA
	BZX84-A/B/C6V2	V_R = 4 V	3	μA
	BZX84-A/B/C6V8	V_R = 4 V	2	μA
	BZX84-A/B/C7V5	V_R = 5 V	1	μA
	BZX84-A/B/C8V2	V_R = 5 V	700	nA
	BZX84-A/B/C9V1	V_R = 6 V	500	nA
	BZX84-A/B/C10	V_R = 7 V	200	nA
	BZX84-A/B/C11	V_R = 8 V	100	nA
	BZX84-A/B/C12	V_R = 8 V	100	nA
	BZX84-A/B/C13	V_R = 8 V	100	nA
	BZX84-A/B/C15 to 75	V_R = 0.7V_{Znom}	50	nA

Table 1 Per type BZX84-**A/B/C2V4** to **A/B/C24**
T_j = 25 °C unless otherwise specified.

BZX84-Axxx Bxxx Cxxx	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 5 mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 5 mA (see Figs 4 and 5)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		Tol. approx. ±5% (C)		at I_{Ztest} = 1 mA		at I_{Ztest} = 5 mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
2V4	2.37	2.43	2.35	2.45	2.2	2.6	275	600	70	100	–3.5	–1.6	0	450	6.0
2V7	2.67	2.73	2.65	2.75	2.5	2.9	300	600	75	100	–3.5	–2.0	0	450	6.0
3V0	2.97	3.03	2.94	3.06	2.8	3.2	325	600	80	95	–3.5	–2.1	0	450	6.0
3V3	3.26	3.34	3.23	3.37	3.1	3.5	350	600	85	95	–3.5	–2.4	0	450	6.0
3V6	3.56	3.64	3.53	3.67	3.4	3.8	375	600	85	90	–3.5	–2.4	0	450	6.0
3V9	3.86	3.94	3.82	3.98	3.7	4.1	400	600	85	90	–3.5	–2.5	0	450	6.0
4V3	4.25	4.35	4.21	4.39	4.0	4.6	410	600	80	90	–3.5	–2.5	0	450	6.0
4V7	4.65	4.75	4.61	4.79	4.4	5.0	425	500	50	80	–3.5	–1.4	0.2	300	6.0
5V1	5.04	5.16	5.00	5.20	4.8	5.4	400	480	40	60	–2.7	–0.8	1.2	300	6.0
5V6	5.54	5.66	5.49	5.71	5.2	6.0	80	400	15	40	–2.0	1.2	2.5	300	6.0
6V2	6.13	6.27	6.08	6.32	5.8	6.6	40	150	6	10	0.4	2.3	3.7	200	6.0
6V8	6.73	6.87	6.66	6.94	6.4	7.2	30	80	6	15	1.2	3.0	4.5	200	6.0
7V5	7.42	7.58	7.35	7.65	7.0	7.9	30	80	6	15	2.5	4.0	5.3	150	4.0
8V2	8.11	8.29	8.04	8.36	7.7	8.7	40	80	6	15	3.2	4.6	6.2	150	4.0
9V1	9.00	9.20	8.92	9.28	8.5	9.6	40	100	6	15	3.8	5.5	7.0	150	3.0
10	9.90	10.10	9.80	10.20	9.4	10.6	50	150	8	20	4.5	6.4	8.0	90	3.0
11	10.80	11.11	10.80	11.20	10.4	11.6	50	150	10	20	5.4	7.4	9.0	85	2.5
12	11.88	12.12	11.80	12.20	11.4	12.7	50	150	10	25	6.0	8.4	10.0	85	2.5
13	12.87	13.13	12.70	13.30	12.4	14.1	50	170	10	30	7.0	9.4	11.0	80	2.5
15	14.85	15.15	14.70	15.30	13.8	15.6	50	200	10	30	9.2	11.4	13.0	75	2.0
16	15.84	16.16	15.70	16.30	15.3	17.1	50	200	10	40	10.4	12.4	14.0	75	1.5
18	17.82	18.18	17.60	18.40	16.8	19.1	50	225	10	45	12.4	14.4	16.0	70	1.5
20	19.80	20.20	19.60	20.40	18.8	21.2	60	225	15	55	14.4	16.4	18.0	60	1.5
22	21.78	22.22	21.60	22.40	20.8	23.3	60	250	20	55	16.4	18.4	20.0	60	1.25
24	23.76	24.24	23.50	24.50	22.8	25.6	60	250	25	70	18.4	20.4	22.0	55	1.25

Table 2 Per type BZX84-**A/B/C27** to **A/B/C75**
T_j = 25 °C unless otherwise specified.

BZX84-Axxx Bxxx Cxxx	WORKING VOLTAGE V_Z (V) at I_{Ztest} = 2 mA						DIFFERENTIAL RESISTANCE r_{dif} (Ω)				TEMP. COEFF. S_Z (mV/K) at I_{Ztest} = 2 mA (see Figs 4 and 5)			DIODE CAP. C_d (pF) at f = 1 MHz; V_R = 0 V	NON-REPETITIVE PEAK REVERSE CURRENT I_{ZSM} (A) at t_p = 100 µs; T_{amb} = 25 °C
	Tol. ±1% (A)		Tol. ±2% (B)		Tol. approx. ±5% (C)		at I_{Ztest} = 0.5 mA		at I_{Ztest} = 2 mA						
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	TYP.	MAX.	TYP.	MAX.	MIN.	TYP.	MAX.	MAX.	MAX.
27	26.73	27.27	26.50	27.50	25.1	28.9	65	300	25	80	21.4	23.4	25.3	50	1.0
30	29.70	30.30	29.40	30.60	28.0	32.0	70	300	30	80	24.4	26.6	29.4	50	1.0
33	32.67	33.33	32.30	33.70	31.0	35.0	75	325	35	80	27.4	29.7	33.4	45	0.9
36	35.64	36.36	35.30	36.70	34.0	38.0	80	350	35	90	30.4	33.0	37.4	45	0.8
39	38.61	39.39	38.20	39.80	37.0	41.0	80	350	40	130	33.4	36.4	41.2	45	0.7
43	42.57	43.43	42.10	43.90	40.0	46.0	85	375	45	150	37.6	41.2	46.6	40	0.6
47	46.53	47.47	46.10	47.90	44.0	50.0	85	375	50	170	42.0	46.1	51.8	40	0.5
51	50.49	51.51	50.00	52.00	48.0	54.0	90	400	60	180	46.6	51.0	57.2	40	0.4
56	55.44	56.56	54.90	57.10	52.0	60.0	100	425	70	200	52.2	57.0	63.8	40	0.3
62	61.38	62.62	60.80	63.20	58.0	66.0	120	450	80	215	58.8	64.4	71.6	35	0.3
68	67.32	68.68	66.60	69.40	64.0	72.0	150	475	90	240	65.6	71.7	79.8	35	0.25
75	74.25	75.75	73.50	76.50	70.0	79.0	170	500	95	255	73.4	80.2	88.6	35	0.2

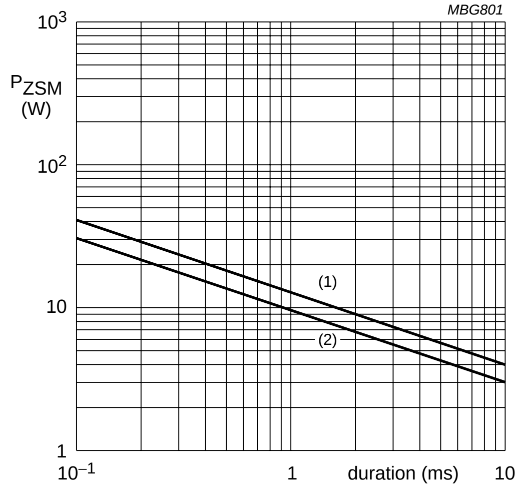
THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}tp}$	thermal resistance from junction to tie-point		330	K/W
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

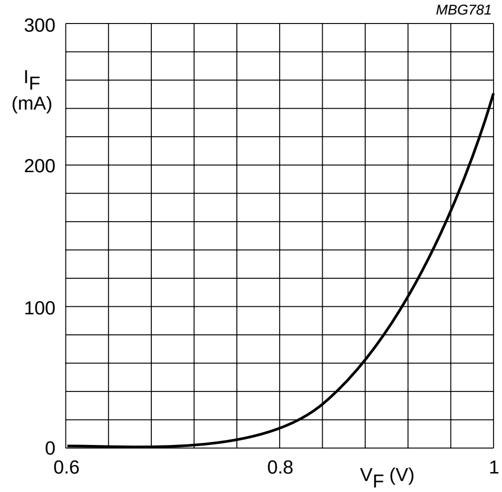
1. Device mounted on an FR4 printed circuit-board.

GRAPHICAL DATA



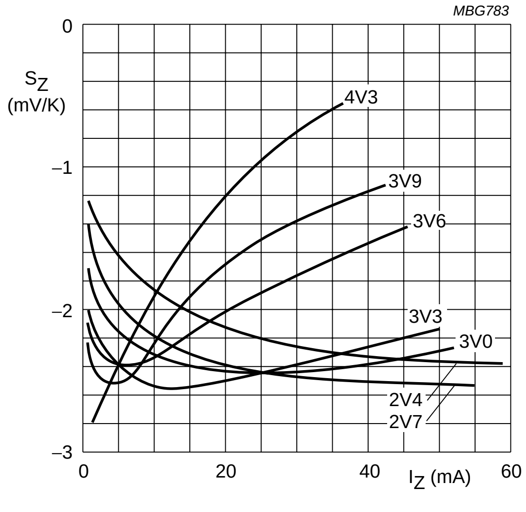
(1) T_j = 25 °C (prior to surge).
(2) T_j = 150 °C (prior to surge).

Fig.2 Maximum permissible non-repetitive peak reverse power dissipation versus duration.



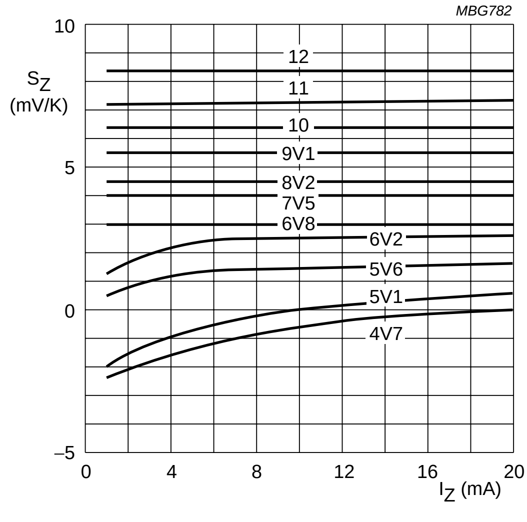
T_j = 25 °C.

Fig.3 Forward current as a function of forward voltage; typical values.



BZX84-A/B/C2V4 to A/B/C4V3.
T_j = 25 to 150 °C.

Fig.4 Temperature coefficient as a function of working current; typical values.

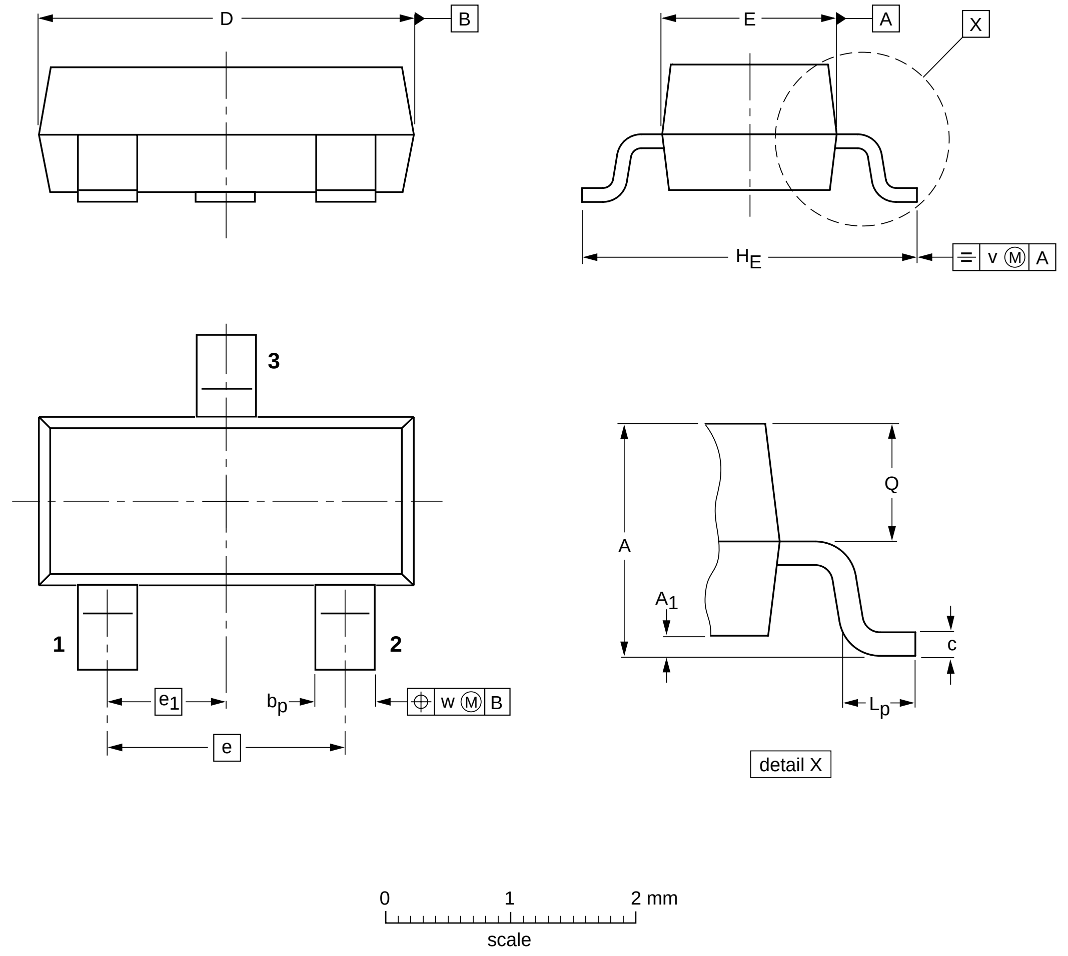


BZX84-A/B/C4V7 to A/B/C12.
T_j = 25 to 150 °C.

Fig.5 Temperature coefficient as a function of working current; typical values.

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				~~97-02-28~~ 99-09-13

DATA SHEET STATUS

DOCUMENT STATUS[(1)]	PRODUCT STATUS[(2)]	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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NXP Semiconductors

Customer notification

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Contact information

For additional information please visit: **http://www.nxp.com**
For sales offices addresses send e-mail to: **salesaddresses@nxp.com**

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